

A SUMMARY OF BIOLOGICAL DATA COLLECTED DURING
THE 1993 BRISTOL BAY RED KING CRAB TAGGING STUDY

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INTRODUCTION

In 1990 the Alaska Department of Fish and Game (ADF&G) initiated passive integrated transponder (PIT) tagging studies of red king crabs *Paralithodes camtschaticus* in Bristol Bay (Watson et al. 1991). A second ADF&G tagging study was conducted in the summer of 1991 for the primary purpose of externally tagging mature male red king crabs using polyvinyl isthmus tags (see Gray 1965). In 1992 the main objective of the test fishery charter was cost recovery fishing, however several other projects were carried out during fishing. The overall purpose of ADF&G tagging studies conducted on Bristol Bay red king crabs has been extensively explained (Watson et al. 1991; Pengilly and Watson 1992).

The main objectives of the 1993 test fishery charter were: 1) an at-sea tagging study to assess handling mortality of commercially harvested red king crabs, and 2) cost recovery fishing to fund the test fishery project for FY 94. Biological data were collected on all commercially important crab species in sampled catches. Additionally, crabs were collected for shellfish observer training, paralytic shellfish poison (PSP) testing and genetic stock identification. Other tasks included photographic/video documentation of fishing activities and crab species of interest. The purpose of this report is to document the catch composition of crabs and other related data from the test fishery charter. Data on the handling mortality tagging study will be dealt with in a separate report, but biological data collected on tagged crabs are presented here.

METHODS AND PROCEDURES

For purposes of this report, terms related to the classification of sampled red king crabs are as follows:

- | | |
|-----------------------------|---|
| <i>Carapace Length (CL)</i> | - the straight line distance from the posterior margin of the right eye orbit to the medial-posterior margin of the carapace. |
| <i>Legal Size</i> | - male crabs ≥ 165 mm (6.5 in) in width including lateral spines. |
| <i>Pre-Recruit Males</i> | - male crabs between 132-164 mm (5.2-6.4 in) in width. |
| <i>Mature Males</i> | - male crabs ≥ 120 mm CL. |
| <i>Immature Males</i> | - male crabs < 120 mm CL. |
| <i>New-Shell Males</i> | - individuals that molted during the last molting season. |
| <i>Old-Shell Males</i> | - individuals that failed to molt during the last molting season. |

Tanner *Chionoecetes bairdi* and snow *Chionoecetes opilio* crabs were classified as follows:

- | | |
|----------------------------|---|
| <i>Carapace Width (CW)</i> | - the straight line distance across the carapace at a right angle to a line midway between the eyes to the medial-posterior margin of the carapace. |
| <i>Legal Size</i> | - male Tanner crabs ≥ 138 mm (5.5 in) width, not including lateral spines. |
| <i>New-Shell Males</i> | - individuals that molted during the last molting season. |
| <i>Old-Shell Males</i> | - individuals that failed to molt during the last molting season. |

Fishing Itinerary

Fishing took place during a 21 d period from September 30 to October 20, 1993 aboard the 31-m (101-ft) chartered crabber, FV *Cascade* just prior to the 1993 Bristol Bay red king crab fishery. Tagging, biological data collection and collection of crabs were conducted throughout the charter with cost recovery fishing occurring during the last week of the charter.

Fishing Area

The initial fishing area was chosen by the captain from information gathered during his previous commercial fishing trips. Since the relative abundance of legal-sized crabs remained high throughout fishing operations, emphasis was placed on setting the pots over as large an area as possible while still maintaining a locational proximity that minimized running time from one string to the next.

The general fishing area was similar to the area fished during past charters: between 56° and 57° N latitude and 161° and 164° W longitude. However, most fishing was conducted between 162° and 163° W longitude (Figures 1 and 2). Large concentrations of legal red king crabs have been found in this area since 1990 (Stevens and MacIntosh 1990; Stevens et al. 1991, 1992, 1993; Byersdorfer and Watson 1992, 1993).

Sampling Design

Five to ten randomly selected pots were chosen each day for catch composition. Once the number of pots to be pulled that day was known, the pot numbers were chosen by using a table of random digits. A minimum of three tagging stations were to be attempted each day; stations were added or subtracted depending on cost recovery efforts (Watson and Pengilly 1994). Fishing was done using 2.1-m x 2.1-m (7.0-ft x 7.0-ft) commercial side-loading king crab pots with 12.7-cm (5.0-in) stretch mesh. Pots were set out in strings which varied in orientation, length and distance between the strings. The itinerary for setting and picking pots was determined on a daily basis by the captain and ADF&G crew leader and was largely dependent on the tagging objectives of the day. Pots were baited with 1.9 L (2.0 qt) of frozen herring and when available, Pacific cod *Gadus macrocephalus* was used as hanging bait.

Detailed methodology for sampling design is in Watson and Pengilly (1994).

Catch Sampling

The contents of each randomly sampled pot were unloaded to a sorting table where all crabs were separated by species and then transferred to another table for measuring. Each sampled crab was measured to the nearest millimeter (carapace length or CL for king crab; carapace width or CW for Tanner and snow crabs). An additional, commercial measure of carapace width was made for male red king and Tanner crabs to classify them as either legal or sublegal. Shell age of king, Tanner and snow crabs was also assessed.

To allow sufficient time for tagging and other collections, pots that contained large numbers of crab were subsampled. A minimum of 20 randomly selected red king crab males and all red king crab females were measured. A minimum of 5 randomly selected Tanner males and all Tanner females were measured. The sampling fraction was determined for each sampled group and recorded with each pot. Expansions of data using the sampling fraction were done for each crab. Thus, for a pot with 20 crabs, 5 of which were sampled, the fraction was 4.0 and each crab counted for four crabs in summaries (eg. size, shell age).

All sampled crabs were grossly examined for disease, handling induced injury or mortality and all sampled females were examined for the presence of eggs, empty egg cases, and egg stalks for determination of maturity.

Sampling instructions are detailed in Watson and Pengilly (1994).

Length frequency and shell data were obtained on the 4,171 legal red king crabs that were tagged for the at sea handling mortality study. A maximum of 30 legal, healthy, non-injured crabs per pot were measured, shell-aged, tagged and released. Data on the handling mortality study will be presented in a later report but the length frequency and shell age data are presented here.

Ancillary Data Collections

Crabs were collected opportunistically throughout the charter for the fall 1993 mandatory shellfish observer practicum scheduled to take place aboard the vessel following the completion of the test fishery charter. In particular, crabs of commercial value were retained for this test.

At the request of the Department of Environmental Conservation (DEC), 12 red king crabs, snow and Tanner crabs, Tanner hybrids and any snails caught were collected from each statistical area fished and frozen whole. These specimens were turned over to DEC upon completion of the charter for subsequent analysis to determine the baseline level of paralytic shellfish poison (PSP) and domoic acid present in the viscera of commercially-important Bering Sea shellfish.

A minimum of 100 live red king crab representative of all size categories and shell conditions from one (but not more than two) statistical areas was to be obtained for a statewide genetic stock identification project. Crabs were to be taken from areas of crab concentration, and from a minimum of 20 pots to achieve "random" selection of crabs, and transported live to Dutch Harbor where dissections and tissue collections would be made.

Instructions for all ancillary data collections are described in Watson and Pengilly (1994).

RESULTS AND DISCUSSION

A total of 23 strings of gear were fished with 14-51 pots in a string. A total of 609 pots were set and pulled over a 15 d period; 53 pots were randomly sampled and 168 pots were designated as tagging pots. Tagging operations were given paramount consideration on a daily basis in

relation to random pot sampling and specimen collection. At the discretion of the cruise leader random pot sampling was suspended on several days so that efforts could be devoted solely to tagging. The number of pots pulled each day varied from 20-71 but the number of pots randomly sampled per day varied from 0-10, and the number of pots from which crab were tagged each day varied from 0-32. Soak time averaged 80 h per pot and ranged from 32 h to 165 h. The first four fishing strings contained 46-51 pots per string. The remainder of the strings were made up of 2-23 tagging stations per string.

Each tagging station consisted of two pots spaced 0.2 km (0.125 nm) apart. In contrast, the distance between individual pots not contained in a tagging station and the distance between tagging stations in the string was 0.8 km (0.5 nm), except in the last several strings where the distance between pots (or tagging stations) was increased to 1.6 km (1.0 nm) to enable the captain to cover a wider fishing area. A total of 21,507 pre-recruit and legal male red king crabs were captured in the 609-pot fishing effort.

Catch Composition

A total of 3,690 crabs were captured in the 53 random pot samples. Red king crabs predominated sample catches (93.5%), followed by Tanner crabs (6.3%), snow crabs (0.1%) and Tanner hybrids (0.1%). No Korean hair crabs *Erimacrus isenbeckii* were found in the sampled pots although several other pots contained pairs of Korean hair crabs. On several occasions these crabs were observed to be in the process of mating while in the pots. All female hair crabs showed signs of recent molt activity.

A total of 6,477 king crabs were captured in the 168 tagging pots and of these 4,171 legal crabs were tagged and sampled. The 1993 charter was not a systematic crab survey and these data are not directly comparable to results from previous surveys. However, it is worth noting that there were a large number of mature male red king crabs caught within the area shown in Figure 1. For the remainder of this report only results related to red king crab and Tanner crab will be reported.

Red King Crab

A total of 3,451 red king crabs were caught in the 53 random pot samples of which 1,118 were sampled. King crab data presented hereafter for random pot samples has been expanded to reflect the 3,451 crabs caught in the 53-pot sample. A total of 6,477 red king crabs were caught in the 168 tagging pots of which 4,171 were sampled. King crab data presented hereafter for tagging pots has been expanded to reflect the 6,477 crabs caught in the 168-pot sample.

Sex Composition and Catch Per Unit Effort

A total of 3,451 red king crabs were caught in the 53 randomly sampled pots; 99% were males and 1% were females. A total of 6,477 red king crabs were caught in the 168 tagging pots; the percentage of males to females was not ascertained. Catch per pot (C/P) of legal male red king crabs in the randomly sampled pots ranged from 3 to 71 with an average of 30 crabs (Appendix

A). Catch per pot (C/P) of legal male red king crabs in the tagging pots ranged from 3 to 92 with an overall average of 39 crabs (Appendix C). Overall C/P of legal male red king crabs was higher in 1991 and 1992 catches in both test fishery and commercial fishery pots. For example, the average C/P of legal male red king crabs in the 1991 survey was 16.7 and in the 1992 survey it was 12.3 crabs (versus 30 and 39 crabs per pot in 1993 respectively)(Byersdorfer and Watson 1993). Similarly, the average C/P of legal male red king crabs increased from the 1992 commercial fishery, from 6 crabs per pot in 1992 to 9 crabs per pot in 1993 (ADF&G 1994). Male and female red king crab catch per pot is summarized in Appendix A.

Length Distribution and Shell Age

Length frequency distributions for male and female red king crabs in random pot samples are shown in Figure 3. Male red king crab size modes were noted around 120, 145, and 160 mm CL. The average size of legal male crabs in random pot samples was 149 mm, slightly less than observed in the 1991 and 1992 surveys (Byersdorfer and Watson 1992 and 1993) and the 1992 the 1993 Bristol Bay red king crab fisheries (ADF&G 1994). Of the 2,683 mature males (≥ 120 mm CL) in random pot samples 60% were of legal size. Length frequency distributions for legal male red king crabs in tagging pots are shown in Figure 4.

Among all males in random pot samples, 92% were new-shell and 8% were old-shell crabs (Figure 5). However, of the 1,612 legal-size males caught, 17% were old-shell. This is similar to the percentage of old-shell crabs (15%) caught in the 1993 Bristol Bay red king crab fishery (ADF&G 1994). Among the 4,171 legal males in the tagging pots, 80% were new-shell and 20% were old-shell (Figure 6). The percentage of old-shell crabs observed in tagging pots is somewhat higher than noted in the 1993 commercial fishery.

Tanner Crab

A total of 234 Tanner crabs were caught in the 53 random pot samples; however, only 198 crabs were sampled. Tanner crab data presented hereafter has been expanded to reflect the 234 crabs caught in the 53-pot sample. No Tanner crab data was collected from tagging pot catches.

Sex Composition and Catch Per Unit Effort

Of the 234 Tanner crabs caught, 98% were males. The catch of legal male Tanner crabs in the sampled pots ranged from 0 to 18 crabs, with an average of 4.4 crabs per pot. Male and female Tanner crab catch by pot is summarized in Appendix B.

Width Distribution and Shell Age

Width frequency distributions for male and female Tanner crabs are shown in Figure 7. Prominent size modes for males were noted around 134, 148, and 158 mm CW. Among all males, 90% were new-shell and 10% were old-shell (Figure 8). Of the 191 legal males caught 96% were new-shell crabs. Because the vessel targeted on locating and catching recruit and legal male red king crabs, the sex and size composition data presented here for Tanner crabs should not be considered representative of the Bering Sea population.

Cost Recovery

Approximately 8,384 male red king crabs ≥ 152 mm (6 in) and 156 Tanner crabs ≥ 140 mm (5.5 in) CW were sold to offset the cost of 1993 Bering Sea test fishery program. An additional 128 red king crabs were landed as dead loss. The average weight per red king crab as calculated from fish ticket receipt was 2.8 kg (6.3 lb) the same as the average weight in the 1992 test fishery charter (Byersdorfer and Watson 1993). The average weight of Tanner crabs as calculated from the fish ticket receipt was approximately 1.0 kg (2.3 lb).

Ancillary Data Collections

Male and female red king crabs, Tanner, snow and hybrid Tanner crabs and Korean hair crabs were retained throughout the charter for the observer test. Observer candidates identified, measured, counted and examined all retained crabs during offloading on October 21, 1993.

A total of 17 Tanner crabs, 1 Tanner hybrid, 6 snow crabs and 10 red king crabs were collected from 4 statistical areas for analysis by DEC for the presence of PSP and domoic acid. Trace amounts of PSP was found in one Tanner crab collected from the northeastern part of the survey area in statistical area 625630 (Mike Ostasz, Department of Environmental Conservation, Anchorage, personal communication).

A collection of 50 live male and 50 live female red king crabs from all size categories and shell conditions was obtained for the statewide genetic stock identification project conducted by ADF&G. Selected crabs were obtained from two statistical areas from a minimum of 20 pots. All crabs taken from one pot were placed in a burlap sack, secured, labeled and placed in a live tank aboard the vessel. Crabs were transported live and dissections and tissue collections were done in Dutch Harbor on October 21, 1993. Tissues were immediately frozen in liquid nitrogen and transported to the Anchorage Genetics Laboratory for storage and analysis. Results from these studies will be reported at a later date. (Sue Merkouris, Alaska Department of Fish and Game, personal communication).

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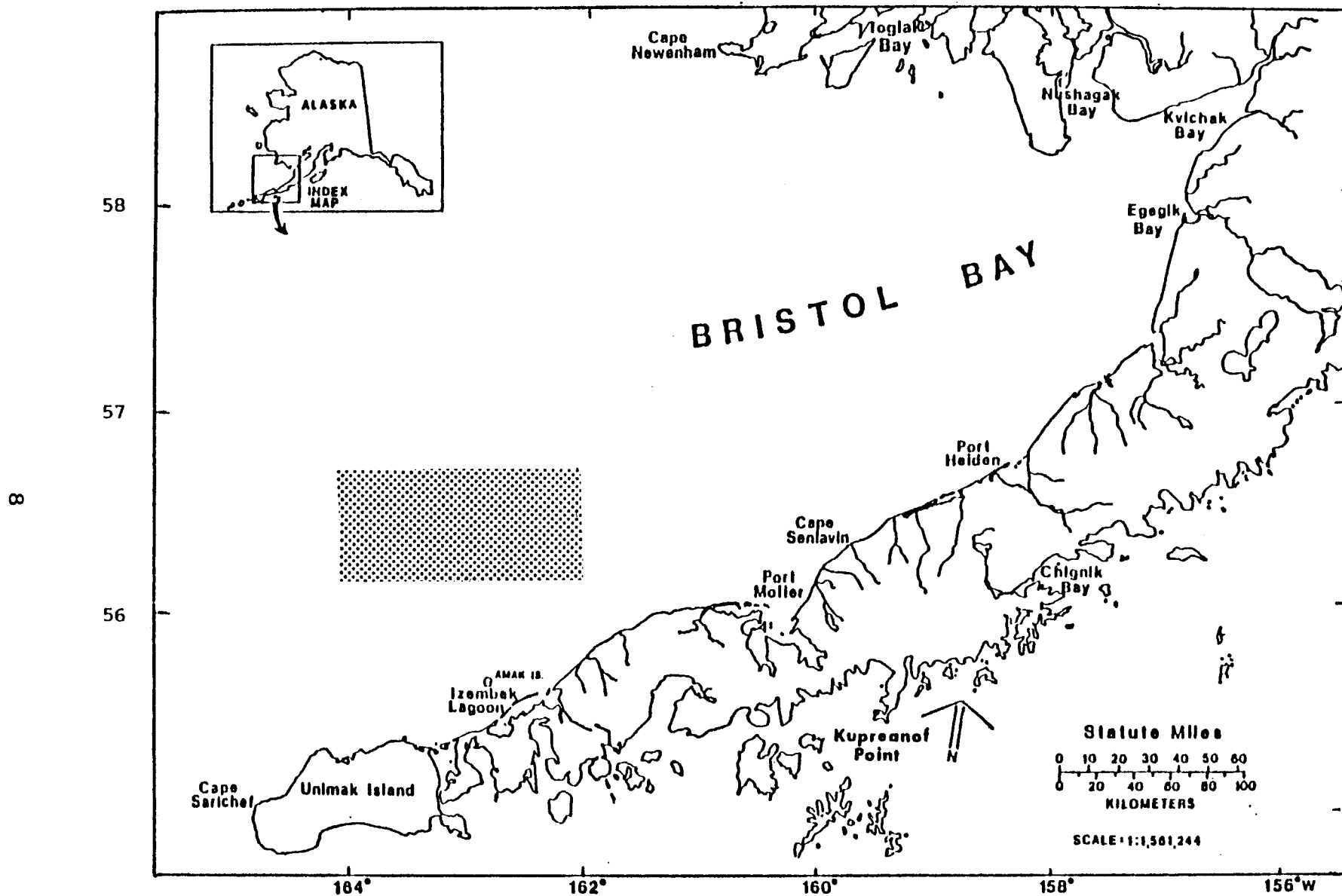


Figure 1. Location of the 1993 Bristol Bay red king crab tagging study.

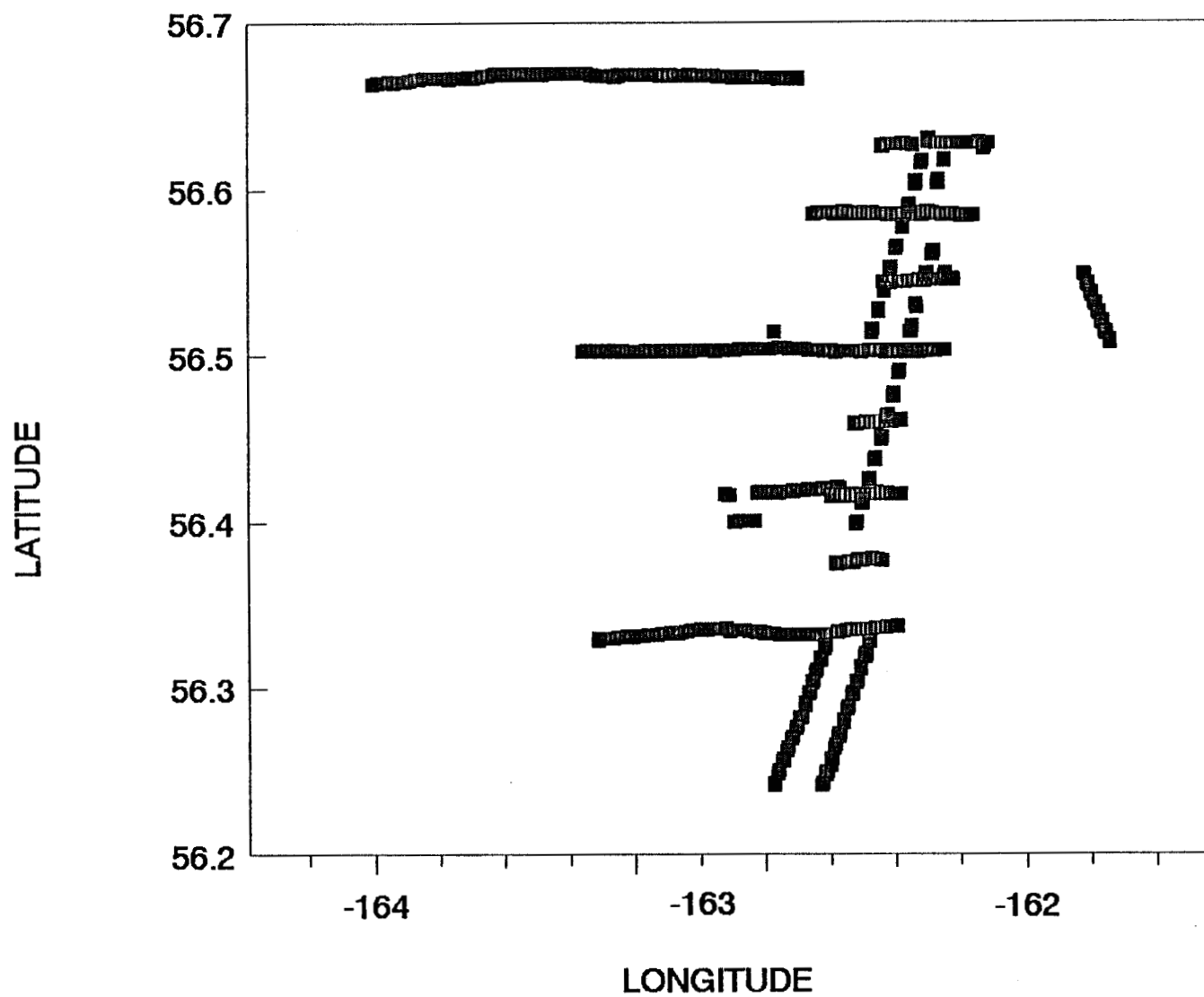


Figure 2. Location of pots pulled during the 1993 Bristol Bay red king crab tagging study.

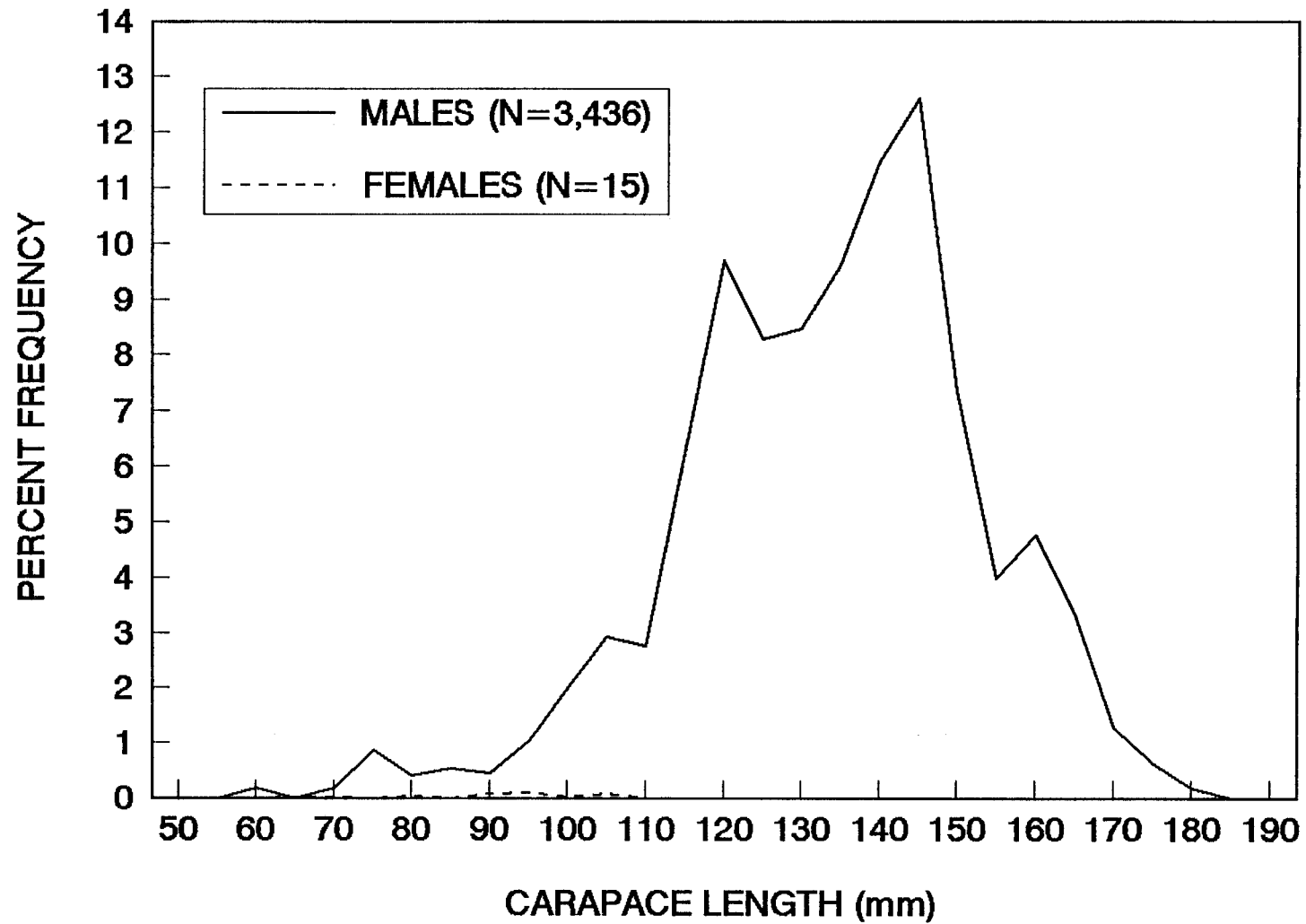


Figure 3. Length frequency of male and female red king crabs caught in random pot samples during the 1993 Bristol Bay tagging study, by 5-mm length classes.

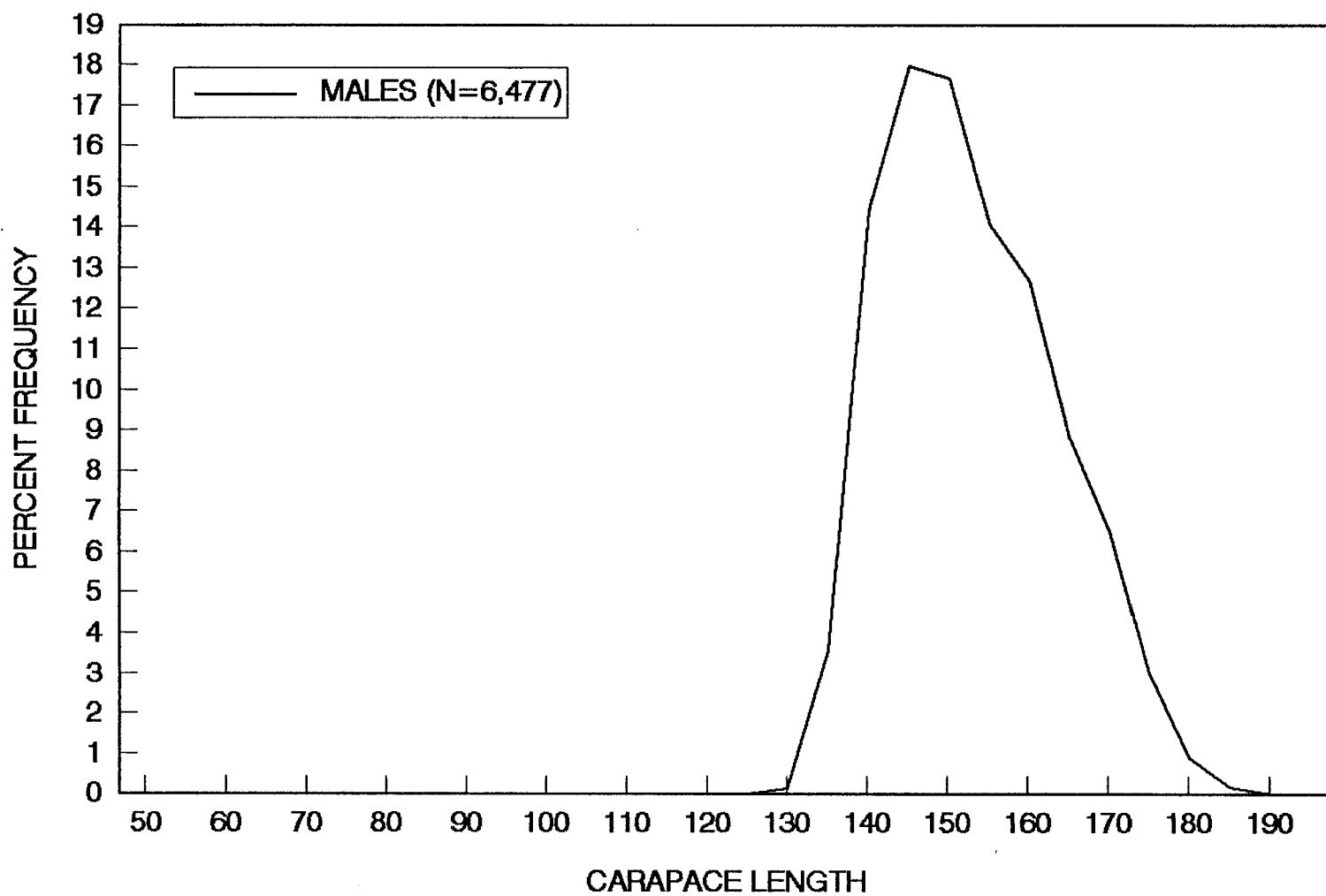


Figure 4. Length frequency of legal male red king crabs caught in tagging pots during the 1993 Bristol Bay tagging study, by 5-mm length classes.

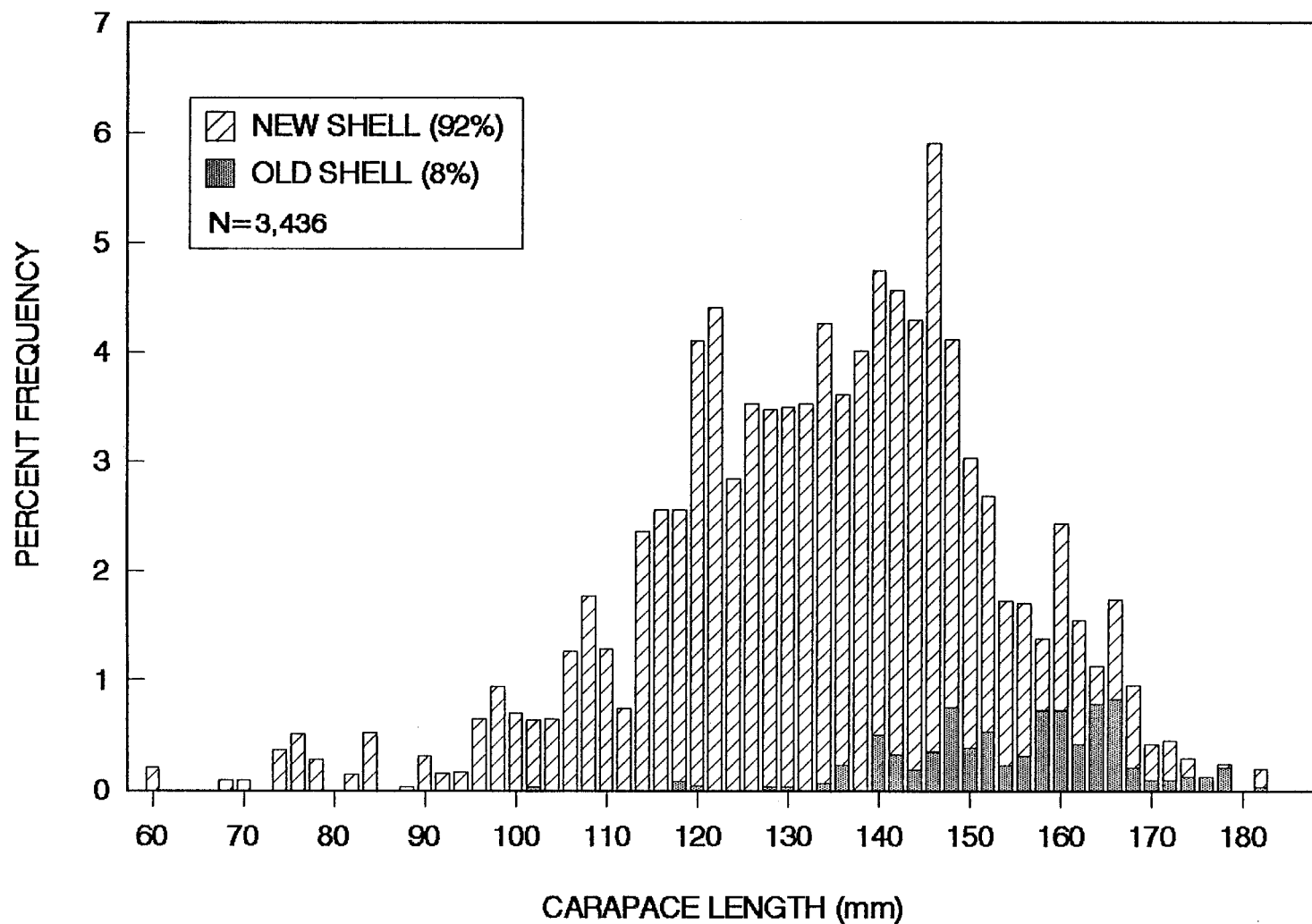


Figure 5. Shell age of male red king crabs caught in random pot samples during the 1993 Bristol Bay tagging study, by 2-mm length classes.

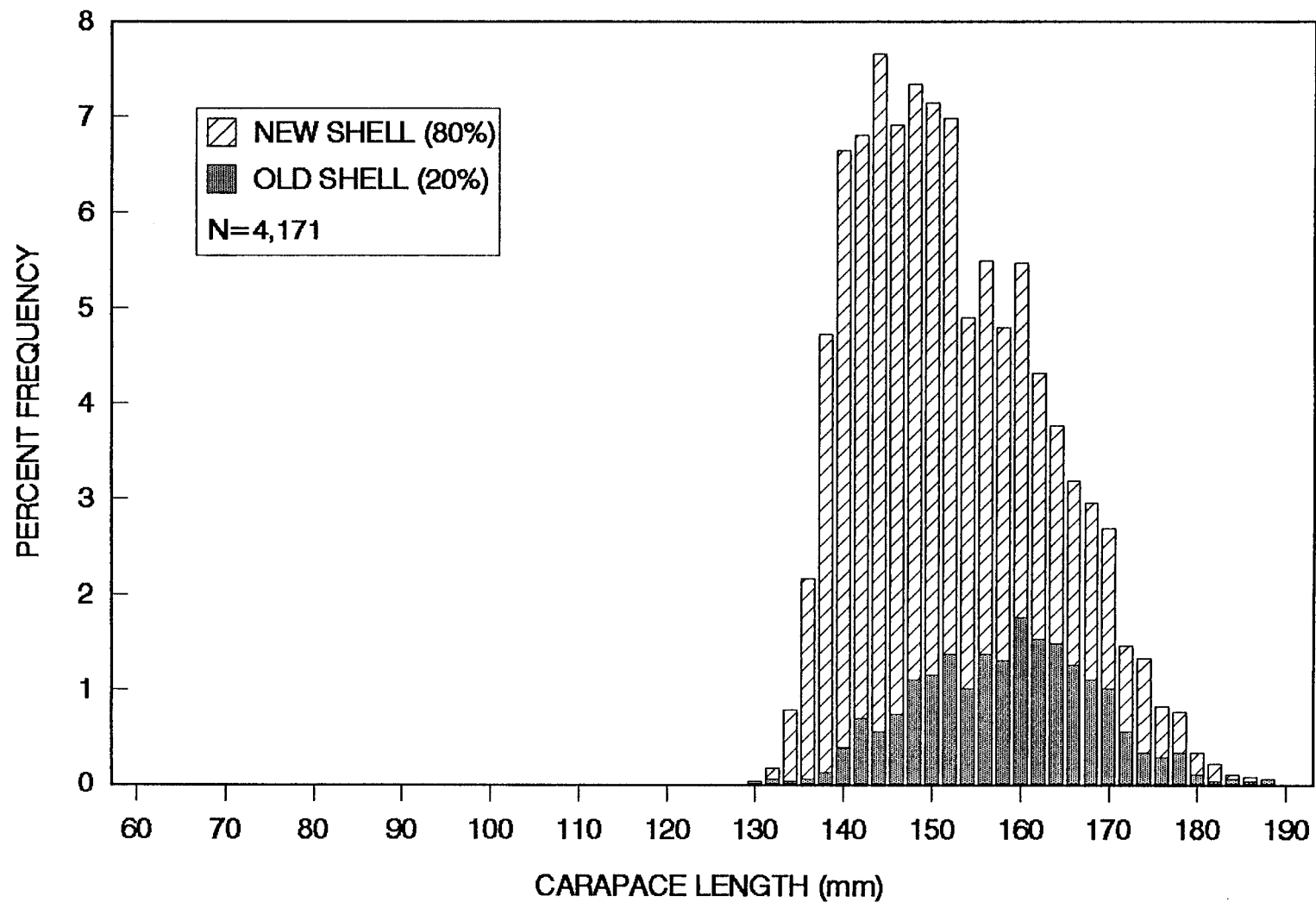


Figure 6. Shell age of legal male red king crabs caught in tagging pots during the 1993 Bristol Bay tagging study, by 2-mm length classes.

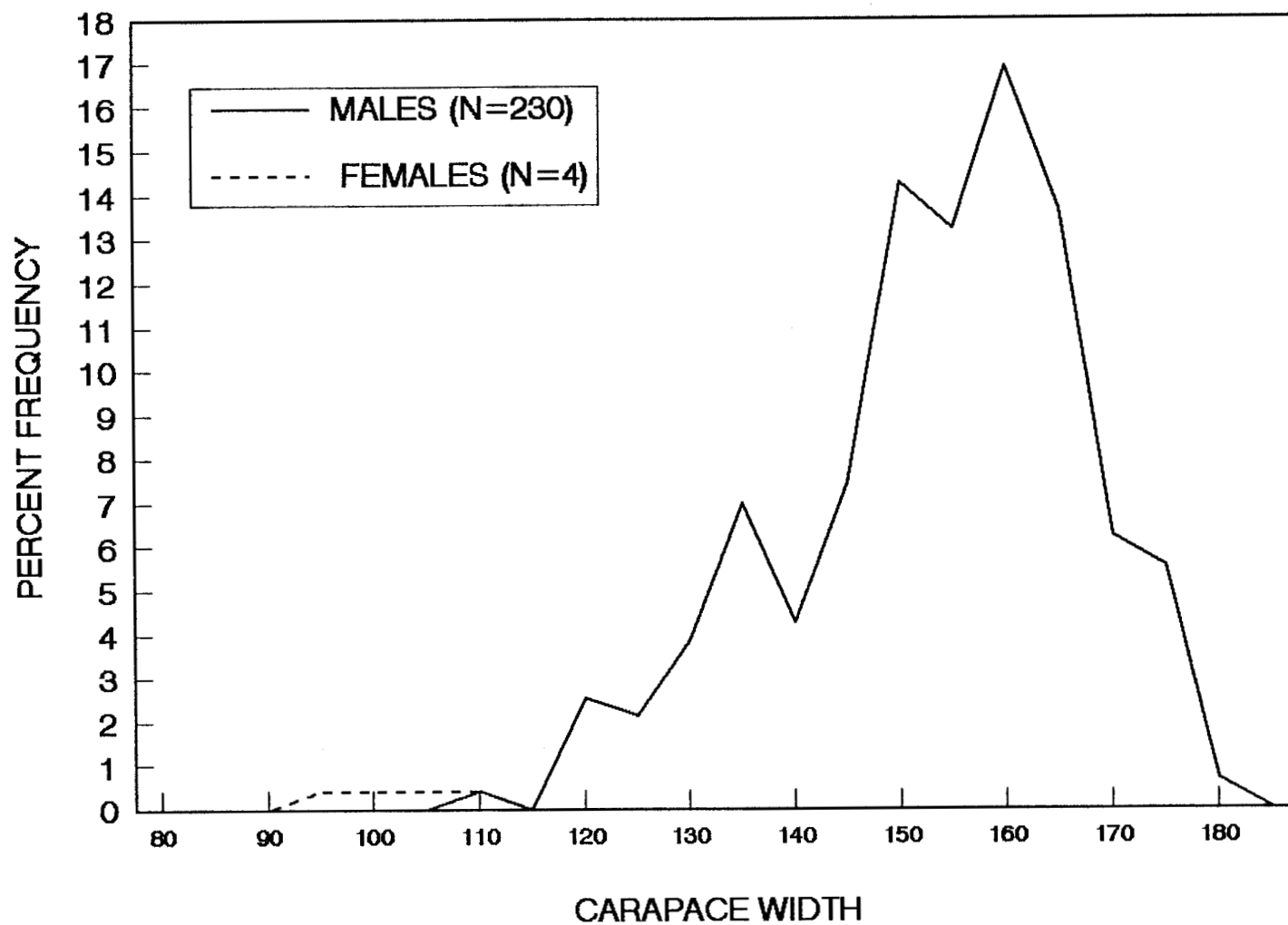


Figure 7. Width frequency of male and female Tanner crabs caught in random pot samples during the 1993 Bristol Bay tagging study, by 5-mm width classes.

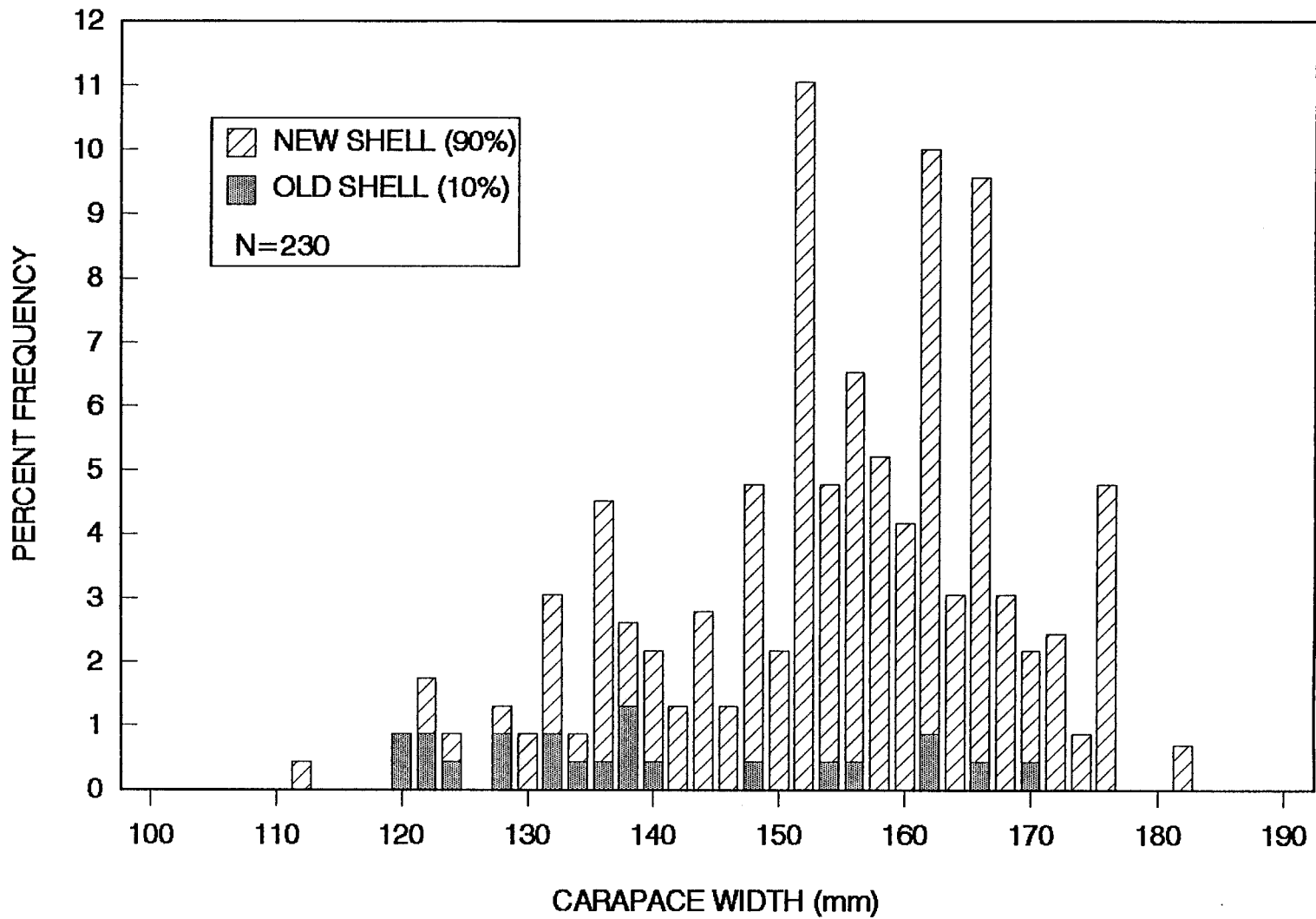


Figure 8. Shell age of male Tanner crabs caught in random pot samples during the 1993 Bristol Bay tagging study, by 2-mm width classes.

APPENDIX

Appendix A. Summary of red king crab fishing and catch data from 53 random pot samples in the 1993 Bristol Bay tagging study.

Pot #	Date	North Latitude		West Longitude		Depth (m)	Catch Per Pot (CPUE)			
							Females	Males		Legal No.
								Sublegal <120mm	>120mm	
8	10/03	56	39.93	163	53.27	77	0	0	0	3
13	10/03	56	39.99	163	48.64	77	0	0	2	12
25	10/03	56	40.13	163	37.84	77	0	0	2	11
26	10/03	56	40.15	163	37.45	77	0	0	4	11
27	10/03	56	40.15	163	36.11	77	0	0	4	13
36	10/03	56	40.17	163	27.92	77	0	10	19	10
39	10/03	56	40.16	163	24.98	77	0	2	5	11
41	10/03	56	40.18	163	23.28	77	0	1	6	16
45	10/03	56	40.14	163	19.73	77	0	1	6	13
47	10/03	56	30.18	163	21.52	81	0	0	2	11
77	10/04	56	30.21	162	54.34	81	0	0	9	16
78	10/04	56	30.21	162	53.45	81	0	1	16	30
81	10/04	56	30.24	162	50.70	81	0	1	14	35
82	10/04	56	30.24	162	49.81	81	0	2	11	21
96	10/04	56	30.18	162	37.10	75	0	80	60	80
98	10/05	56	19.97	162	37.25	77	0	0	4	14
118	10/04	56	20.19	162	55.21	84	0	0	4	16
142	10/04	56	19.87	163	14.22	86	0	0	0	10
152	10/05	56	40.10	163	14.69	77	0	0	9	20
153	10/05	56	40.12	163	13.44	77	0	1	6	6
154	10/05	56	40.13	163	12.52	77	0	1	4	21
156	10/05	56	40.14	163	10.66	75	0	5	14	16
163	10/05	56	40.11	163	5.27	77	0	2	5	12
202	10/06	56	24.07	162	49.94	82	0	4	4	74
205	10/06	56	25.08	162	48.07	79	0	4	15	24
212	10/06	56	25.13	162	42.72	77	0	7	20	40
215	10/06	56	25.17	162	39.95	79	0	8	10	21
223	10/06	56	25.24	162	34.46	79	1	45	22	45
321	10/12	56	35.16	162	27.84	71	0	5	54	40
328	10/12	56	35.12	162	24.50	75	0	0	67	45
357	10/12	56	25.04	162	29.22	75	0	6	13	46
366	10/12	56	25.03	162	24.89	75	0	12	16	51
369	10/12	56	25.03	162	23.67	75	0	27	27	53
379	10/14	56	30.19	162	25.02	77	0	4	31	42
398	10/13	56	20.11	162	32.96	81	0	23	51	40
401	10/13	56	20.14	162	31.82	81	0	0	44	54
402	10/13	56	20.12	162	31.08	81	0	24	28	42
415	10/13	56	20.25	162	25.51	75	0	63	35	42
435	10/13	56	22.69	162	28.01	77	0	11	51	51
447	10/15	56	35.12	162	15.21	75	3	28	45	39
455	10/15	56	35.09	162	11.57	75	0	3	17	55
458	10/15	56	35.10	162	10.00	75	1	26	47	42
466	10/15	56	31.94	161	47.38	86	3	21	64	42
478	10/14	56	37.61	162	25.42	70	0	9	4	13
485	10/14	56	37.64	162	22.46	70	0	1	7	15
488	10/14	56	37.62	162	20.84	71	0	9	8	6
489	10/14	56	37.60	162	20.67	71	0	1	3	8
493	10/16	56	32.64	162	24.96	75	2	43	10	48
496	10/16	56	32.68	162	23.31	75	1	21	49	71
503	10/16	56	32.72	162	20.42	77	1	21	17	38
505	10/16	56	32.72	162	19.49	77	1	67	22	28
517	10/15	56	32.78	162	14.05	77	2	81	12	37
530	10/16	56	27.61	162	26.74	75	0	72	72	54
							15	753	1071	1612

Appendix B. Summary of Tanner crab fishing and catch data in random sample pots in the 1993 Bristol Bay test fishery.

Pot #	Date	North Lati- tude		West Longi- tude		Depth (m)	Females	Catch Per Pot (CPUE)	
								Males	
								Sublegal <138mm	Legal ≥138mm
8	10/03	56	39.93	163	53.27	42	0	2	2
13	10/03	56	39.99	163	48.64	42	1	2	3
25	10/03	56	40.13	163	37.84	42	0	5	6
26	10/03	56	40.15	163	37.45	42	0	2	17
27	10/03	56	40.15	163	36.11	42	0	2	3
36	10/03	56	40.17	163	27.92	42	0	2	2
39	10/03	56	40.16	163	24.98	42	0	1	6
41	10/03	56	40.18	163	23.28	42	0	0	2
45	10/03	56	40.14	163	19.73	42	0	0	2
47	10/03	56	30.18	163	21.52	44	2	3	5
77	10/04	56	30.21	162	54.34	44	0	0	4
78	10/04	56	30.21	162	53.45	44	0	1	17
81	10/04	56	30.24	162	50.7	44	0	0	15
82	10/04	56	30.24	162	49.81	44	0	0	2
96	10/04	56	30.18	162	37.1	41	0	0	3
98	10/05	56	19.97	162	37.25	44	0	0	2
118	10/04	56	20.19	162	55.21	46	0	0	0
142	10/04	56	19.87	163	14.22	47	0	1	3
152	10/05	56	40.1	163	14.69	42	0	1	5
153	10/05	56	40.12	163	13.44	42	0	0	5
154	10/05	56	40.13	163	12.52	42	0	4	18
156	10/05	56	40.14	163	10.66	41	0	2	10
163	10/05	56	40.11	163	5.27	42	1	0	1
202	10/06	56	24.07	162	49.94	45	0	0	6
205	10/06	56	25.08	162	48.07	43	0	0	2
212	10/06	56	25.13	162	42.72	42	0	0	8
215	10/06	56	25.17	162	39.95	43	0	0	4
223	10/06	56	25.24	162	34.46	43	0	0	1
321	10/12	56	35.16	162	27.84	39	0	1	0
328	10/12	56	35.12	162	24.5	41	0	0	0
357	10/12	56	25.04	162	29.22	41	0	0	1
366	10/12	56	25.03	162	24.89	41	0	0	0
369	10/12	56	25.03	162	23.67	41	0	0	0
379	10/14	56	30.19	162	25.02	42	0	0	1
398	10/13	56	20.11	162	32.96	44	0	0	4
401	10/13	56	20.14	162	31.82	44	0	0	2
402	10/13	56	20.12	162	31.08	44	0	0	0
415	10/13	56	20.25	162	25.51	41	0	0	0
435	10/13	56	22.69	162	28.01	44	0	0	4
447	10/15	56	35.12	162	15.21	41	0	1	0
455	10/15	56	35.09	162	11.57	41	0	0	4
458	10/15	56	35.1	162	10.	41	0	0	0
466	10/15	56	31.94	161	47.38	47	0	0	0
478	10/14	56	37.61	162	25.42	38	0	0	0
485	10/14	56	37.64	162	22.46	38	0	1	6
488	10/14	56	37.62	162	20.84	39	0	1	1
489	10/14	56	37.6	162	20.67	39	0	1	2
493	10/16	56	32.64	162	24.96	41	0	0	2
496	10/16	56	32.68	162	23.31	41	0	2	7
503	10/16	56	32.72	162	20.42	42	0	0	0
505	10/16	56	32.72	162	19.49	42	0	0	0
517	10/15	56	32.78	162	14.05	42	0	3	2
530	10/16	56	27.61	162	26.74	41	0	1	1
TOTALS							4	39	191

Appendix C. Summary of red king crab fishing and catch data from 168 tagging pots in the 1993 Bristol Bay tagging study.

Pot #	Date	North Latitude		West Longitude		Depth (m)	Catch Per Pot (CPUE) Legal Males
122	10/04	56	20.16	162	57.60	84	33
123	10/04	56	20.16	162	57.86	84	25
130	10/04	56	20.00	163	4.23	84	13
131	10/04	56	20.06	163	4.51	84	13
147	10/04	56	19.81	163	18.69	86	6
148	10/04	56	19.76	163	18.83	86	10
150	10/05	56	40.05	163	15.47	77	11
151	10/05	56	40.09	163	15.27	77	15
157	10/05	56	40.13	163	10.01	77	3
158	10/05	56	40.12	163	9.82	77	13
164	10/05	56	40.08	163	4.57	75	16
165	10/05	56	40.08	163	4.38	75	13
171	10/05	56	40.09	162	59.20	77	15
172	10/05	56	40.08	162	59.03	77	13
178	10/05	56	40.04	162	53.88	73	18
179	10/05	56	40.03	162	53.63	73	25
185	10/05	56	40.01	162	48.36	73	17
186	10/05	56	40.01	162	48.16	73	33
192	10/05	56	39.98	162	42.93	75	8
193	10/06	56	39.99	162	42.70	73	18
196	10/06	56	24.99	162	54.70	82	49
197	10/06	56	24.99	162	54.55	82	28
203	10/06	56	25.07	162	49.24	81	82
204	10/06	56	25.08	162	49.07	81	39
210	10/06	56	25.10	162	43.83	77	16
211	10/06	56	25.12	162	43.63	77	52
217	10/06	56	25.18	162	38.40	79	46
218	10/06	56	25.18	162	38.23	79	58
225	10/07	56	30.14	162	34.99	75	14
226	10/07	56	30.17	162	34.78	75	59
232	10/07	56	30.16	162	29.61	77	26
233	10/07	56	30.17	162	29.37	77	56
239	10/07	56	30.14	162	24.30	79	47
240	10/07	56	30.13	162	24.08	79	56
246	10/07	56	19.59	162	36.93	81	55
247	10/07	56	19.45	162	37.11	81	87
248	10/07	56	19.10	162	37.79	81	63
249	10/07	56	19.03	162	37.92	81	48
250	10/07	56	18.70	162	38.54	81	51
251	10/07	56	18.62	162	38.70	81	57
252	10/07	56	18.30	162	39.31	81	9
253	10/07	56	18.22	162	39.47	81	33
254	10/08	56	17.88	162	39.88	81	25
255	10/08	56	17.81	162	40.02	81	40
256	10/08	56	17.46	162	40.69	81	8
257	10/08	56	17.40	162	40.75	81	13
258	10/08	56	17.00	162	41.45	81	32
259	10/08	56	16.97	162	41.60	81	23
260	10/08	56	16.65	162	42.19	81	12
261	10/08	56	16.59	162	42.38	81	27

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Appendix C. (page 2 of 4)

Pot #	Date	North Latitude	West Longitude	Depth (m)	Catch Per Pot (CPUE) Legal Males
262	10/08	56 16.28	162 43.04	81	41
263	10/08	56 16.19	162 43.21	81	38
264	10/08	56 15.88	162 43.90	81	44
265	10/08	56 15.78	162 44.02	81	66
266	10/08	56 15.48	162 44.72	81	66
267	10/08	56 15.40	162 44.87	81	56
268	10/08	56 15.07	162 45.58	81	33
269	10/08	56 14.95	162 45.77	81	49
270	10/08	56 14.60	162 46.40	81	42
271	10/08	56 14.50	162 46.45	81	26
272	10/09	56 14.53	162 37.62	79	18
273	10/09	56 14.60	162 37.46	79	13
274	10/09	56 14.92	162 36.91	79	31
275	10/09	56 15.03	162 36.73	79	31
280	10/09	56 16.28	162 34.58	79	48
281	10/09	56 16.40	162 34.39	79	37
282	10/09	56 16.80	162 33.72	79	44
283	10/09	56 16.90	162 33.59	79	40
284	10/09	56 17.26	162 33.00	79	44
285	10/09	56 17.35	162 32.79	79	49
286	10/09	56 17.79	162 32.15	79	19
287	10/09	56 17.84	162 31.94	79	43
288	10/09	56 18.21	162 31.37	79	51
289	10/09	56 18.28	162 31.18	79	43
290	10/09	56 18.70	162 30.51	79	50
291	10/09	56 18.82	162 30.40	79	42
292	10/08	56 19.16	162 29.73	79	32
293	10/08	56 19.27	162 29.54	79	32
294	10/08	56 19.69	162 28.84	79	36
295	10/08	56 19.84	162 28.69	79	22
296	10/10	56 35.15	162 38.92	77	9
297	10/10	56 35.16	162 38.77	77	21
298	10/10	56 35.20	162 38.04	77	5
299	10/10	56 35.18	162 37.94	77	7
300	10/10	56 35.20	162 37.15	77	5
301	10/10	56 35.20	162 36.91	77	8
302	10/10	56 35.20	162 36.22	75	13
303	10/10	56 35.19	162 36.01	75	10
304	10/10	56 35.18	162 35.34	75	18
305	10/10	56 35.17	162 35.12	75	8
306	10/10	56 35.18	162 34.40	75	13
307	10/10	56 35.17	162 34.21	75	52
308	10/10	56 35.21	162 33.47	75	33
309	10/10	56 35.21	162 33.17	75	52
310	10/10	56 35.18	162 32.45	75	24
311	10/10	56 35.16	162 32.23	73	24
312	10/10	56 35.16	162 31.53	71	33
313	10/10	56 35.14	162 31.33	71	33
314	10/10	56 35.14	162 30.60	71	25
315	10/10	56 35.14	162 30.38	71	52
316	10/10	56 35.17	162 29.80	71	32
317	10/10	56 35.17	162 29.48	71	56

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Appendix C. (page 3 of 4)

Pot #	Date	North Latitude	West Longitude	Depth (m)	Catch Per Pot (CPUE) Legal Males
322	10/12	56 35.16	162 27.17	73	62
323	10/12	56 35.14	162 26.95	73	78
326	10/12	56 35.13	162 25.41	73	52
327	10/12	56 35.12	162 25.23	73	50
330	10/12	56 35.14	162 23.61	75	58
331	10/12	56 35.13	162 23.31	75	42
332	10/10	56 35.12	162 22.64	75	53
333	10/10	56 35.10	162 22.30	75	50
334	10/10	56 35.19	162 21.51	75	69
335	10/10	56 35.12	162 21.34	75	71
336	10/10	56 35.13	162 20.81	75	64
337	10/10	56 35.15	162 20.65	75	55
338	10/10	56 35.14	162 19.97	75	61
339	10/10	56 35.13	162 19.72	75	48
340	10/10	56 35.10	162 19.11	75	53
341	10/10	56 35.17	162 18.80	75	51
376	10/14	56 30.18	162 26.60	77	55
377	10/14	56 30.18	162 26.40	77	67
384	10/14	56 30.20	162 19.73	77	92
385	10/14	56 30.19	162 19.47	77	61
390	10/14	56 30.22	162 16.02	77	43
391	10/14	56 30.21	162 15.81	77	61
408	10/13	56 20.18	162 28.48	81	33
409	10/13	56 20.18	162 28.32	81	31
412	10/13	56 20.19	162 26.63	77	29
413	10/13	56 20.22	162 26.42	77	40
438	10/13	56 22.64	162 26.58	81	45
439	10/13	56 22.64	162 26.42	81	35
444	10/15	56 35.14	162 16.34	75	75
445	10/15	56 35.16	162 16.14	75	61
452	10/15	56 35.12	162 12.75	75	63
453	10/15	56 35.11	162 12.53	75	66
462	10/15	56 32.62	161 48.68	86	30
463	10/15	56 32.54	161 48.52	86	37
468	10/15	56 31.59	161 46.75	86	36
469	10/15	56 31.50	161 46.58	86	27
474	10/15	56 30.56	161 44.74	86	15
475	10/15	56 30.48	161 44.62	86	15
494	10/16	56 32.66	162 24.26	75	54
495	10/16	56 32.67	162 24.01	75	57
500	10/16	56 32.71	162 21.50	75	32
501	10/16	56 32.73	162 21.31	77	74
506	10/16	56 32.75	162 18.80	77	67
507	10/16	56 32.74	162 18.57	77	60
518	10/15	56 32.81	162 13.34	77	21
519	10/15	56 32.77	162 13.28	77	48
536	10/16	56 27.65	162 24.05	75	57
537	10/16	56 27.67	162 23.86	75	56
538	10/16	56 27.68	162 23.14	75	49
539	10/16	56 27.68	162 23.04	75	68
542	10/17	56 24.68	162 30.19	79	60
543	10/17	56 24.80	162 30.02	79	52

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Appendix C. (page 4 of 4)

Pot #	Date	North Lati- tude	West Longi- tude	Depth (m)	Catch Per Pot (CPUE) Legal Males
544	10/17	56 25.46	162 29.01	79	57
545	10/17	56 25.56	162 28.88	79	58
548	10/17	56 27.00	162 26.70	77	24
549	10/17	56 27.07	162 26.56	77	46
552	10/17	56 28.55	162 24.42	77	51
553	10/17	56 28.64	162 24.31	77	57
556	10/17	56 30.13	162 22.27	77	56
557	10/17	56 30.22	162 22.14	77	61
558	10/17	56 30.89	162 21.19	77	31
559	10/17	56 31.09	162 20.96	77	46
640	10/18	56 32.90	162 14.78	77	20
641	10/18	56 32.99	162 14.65	77	15
652	10/18	56 37.45	162 7.61	75	5
653	10/18	56 37.53	162 7.48	75	13
TOTAL					6477

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